

glaciers. Avalanches are fairly common in winter. Although the Alps are high mountains, historically they have not been a serious barrier to human interaction. People have crossed the Alps through mountain passes for thousands of years to trade and travel. Other ranges in the Alpine system include the Carpathian (kahr-PAY-thee-uhn) Mountains in Eastern Europe and the Apennines (A-puh-nynz) in Italy. The Pyrenees (PIR-uh-neeZ) of France and Spain are also part of this system.

Beginning about 65 million years ago, tectonic processes formed the mountains of the Alpine system. At that time, the African plate began pushing against the Eurasian plate. This caused the mountains to rise. Tectonic activity continues today. A subduction zone off the coasts of southern Italy and Greece still creates powerful earthquakes and volcanoes. Because it lies on a tectonic plate boundary, Iceland also experiences volcanic eruptions and earthquakes.

READING CHECK: *Physical Systems* How have physical processes affected the shapes of mountains and hills in the Central Uplands?

Connecting to

TECHNOLOGY

Polders

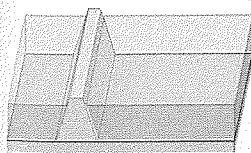
The Dutch have long used technology to shape their natural environment. For hundreds of years, they have been “creating” land by reclaiming it from the sea. Lands reclaimed from the sea are called **polders**.

To create polders, the Dutch built earthen walls called **dikes** along the shoreline. Then they used windmills to pump out the seawater behind the dikes. The Dutch used the drained lands for farming or for housing. By using polders to grow crops and raise livestock, the Dutch greatly increased the amount of available farmland. In fact, the Netherlands is an exporter of agricultural goods. The Dutch export products such as flowers, grains, potatoes, and sugar beets, particularly to other European countries.

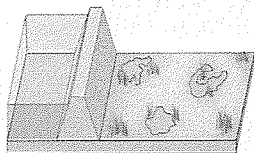
Today more than 25 percent of the Netherlands lies below sea level. A national system of dams, dikes, and floodgates holds back the sea, and water is constantly pumped out. This system ranks as one of the wonders of the modern world. The largest dike, 19 miles (31 km) long and 100 yards (91 m) thick, closes off a large inlet. Completed in 1932, this dike allowed for the creation of four huge polders. Farms and cities have sprung up on these lands.

Comparing In what other areas of the world, or against what environmental hazards, might Dutch techniques for creating polders be useful?

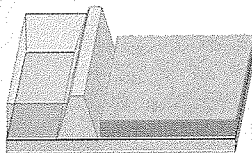
Creating a Polder



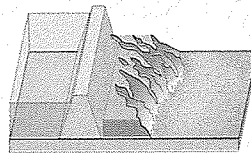
Year 1
Dikes are built around the area to be reclaimed. Pumps and canals drain the water.



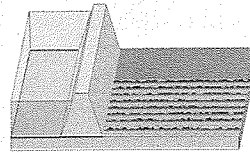
Years 2-3
The water level falls. Seeds blow into the area and salt-tolerant plants grow.



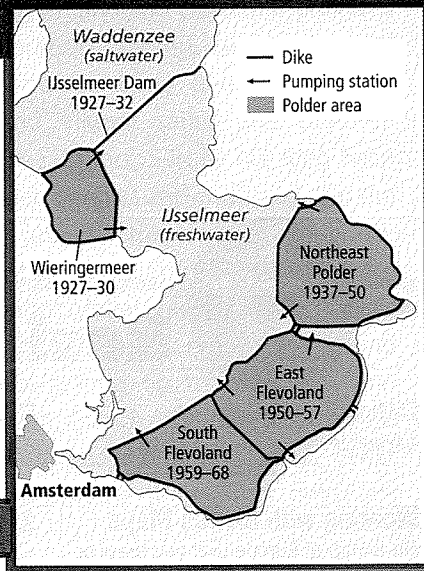
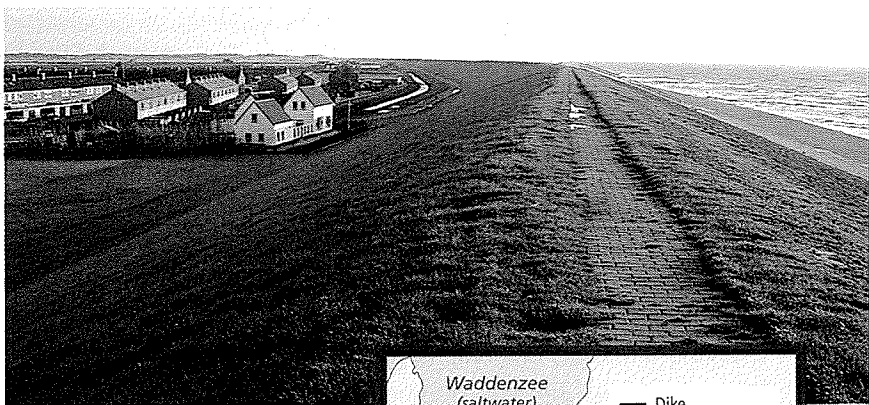
Years 4-6
Reeds are planted over a net of woven twigs. The reeds draw up more water.



Year 7
The reeds are burned. Heavy plows turn their roots and the ash into the soil.



The land is ready for crops. Within 15 years the polder looks like it has been farmed forever.



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KEYWORD: SW3 CH13

FOR: Web sites about the natural environments of Europe

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Water

Europe is nearly surrounded by water. To the south lies the Mediterranean Sea. It is connected to the Black Sea by the narrow Bosphorus (BAHS-puh-ruhs). Geographers consider the Bosphorus a boundary between Europe and Asia. The Arctic Ocean, North Sea, and Baltic Sea wash the shores of northern Europe. The shallow North Sea has long been important for trade and fishing. The smaller Baltic Sea freezes over during the winter months. To the west of Europe lies the North Atlantic Ocean. For centuries, European explorers, fishers, and merchants have traveled the waters of the Atlantic.

Europe's long, irregular coastline has hundreds of good natural harbors. These harbors are generally located near the mouths of **navigable** rivers, making Europe ideally situated for trade by sea. A navigable river is one that is deep enough and wide enough for shipping. Canals connect many rivers in Europe. For example, France's Canal du Midi lets boats and barges travel between the Atlantic Ocean and the Mediterranean Sea. Many interior towns and cities across Europe have access to the sea through canals and rivers.

The Rhine and Danube stand out among Europe's most important rivers. Many cities and industrial areas line their banks, and barges carry goods along their courses. The Rhine rises in the Swiss Alps. It then flows northwestward through Germany and the Netherlands before entering the North Sea. The Danube begins in the uplands of southern Germany. It flows eastward through nine countries in central and eastern Europe. It empties into the Black Sea. Unfortunately, large amounts of pollution enter the ocean from these and other rivers. Cleaning up and controlling pollution in Europe's rivers is a major environmental challenge.

✓ **READING CHECK:** *Environment and Society* How do Europe's interior towns and cities have access to the sea?

Section

1

Review

Define fjords, polders, dikes, navigable

Working with Sketch Maps

On a map of Europe that you draw or that your teacher provides, label the Ural Mountains, Mediterranean Sea, Scandinavian Peninsula, Iberian Peninsula, Italian Peninsula, Balkan Peninsula, Northern European Plain, Alps, Carpathian Mountains, Pyrenees, Black Sea, Bosphorus, North Sea, Rhine River, and Danube River. Which river rises in the Swiss Alps, flows through the Netherlands, and empties into the North Sea?

Reading for the Main Idea

1. **Physical Systems** How did continental ice sheets shape the landscapes of the Northwest Highlands?
2. **Environment and Society** How has Europe's natural environment made human contact relatively easy?

Critical Thinking

3. **Making Generalizations** What are some physical features that probably shaped migration routes in Europe? How do you think they did so?
4. **Analyzing Information** Considering what you know about Europe's natural environments, where would you expect to find many of its largest and most important cities and settlements?



**Homework
Practice
Online**

Keyword: SW3 HP13

Organizing What You Know

5. Copy the chart shown below. Use it to describe Europe's four major landform regions: the Northwest Highlands, Northern European Plain, Central Uplands, and the Alpine mountain system.

Northwest Highlands	
Northern European Plain	
Central Uplands	
Alpine mountain system	